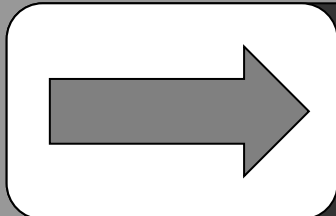


Wed Sept 17<sup>th</sup> 2014.

CIVL 498C Life Cycle Assessment

## Week 3: EPDs, PCRs and Critical Review



slide to unlock

# Life Cycle Assessment

## Guiding Standards

- **ISO 14040:2006**, Environmental management – Life cycle assessment – **Principles and framework**
- **ISO14044:2006**; Environmental management – Life cycle assessment- **Requirements and guidelines**

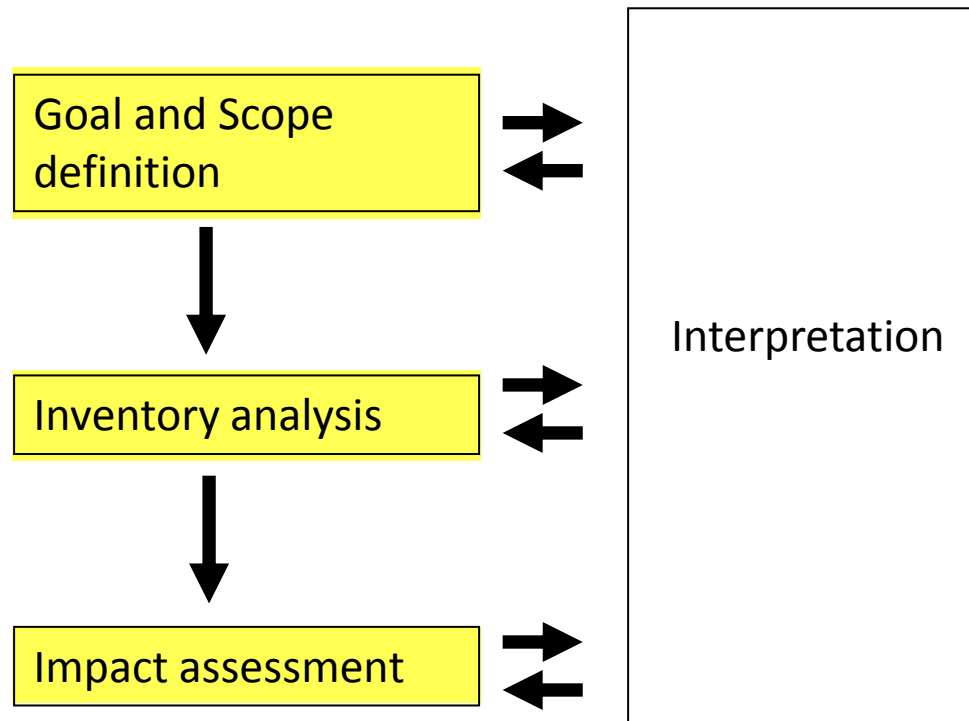
# Life Cycle Assessment

## LCA Framework

Defining and planning the study to be carried out on the system in question.

Measuring physical inputs and outputs from the system in question.

Assigning an environmental significance to inputs and outputs from the system in question.



( ISO 14040:2006)

# Life Cycle Assessment

## Guiding Standards

- **ISO 14040:2006**, Environmental management – Life cycle assessment – **Principles and framework.**
- **ISO14044:2006**; Environmental management – Life cycle assessment- **Requirements and guidelines.**
- **ISO 14025:2006** establishes the principles and specifies the procedures for developing Type III environmental declaration **programmes and Type III environmental declarations.**

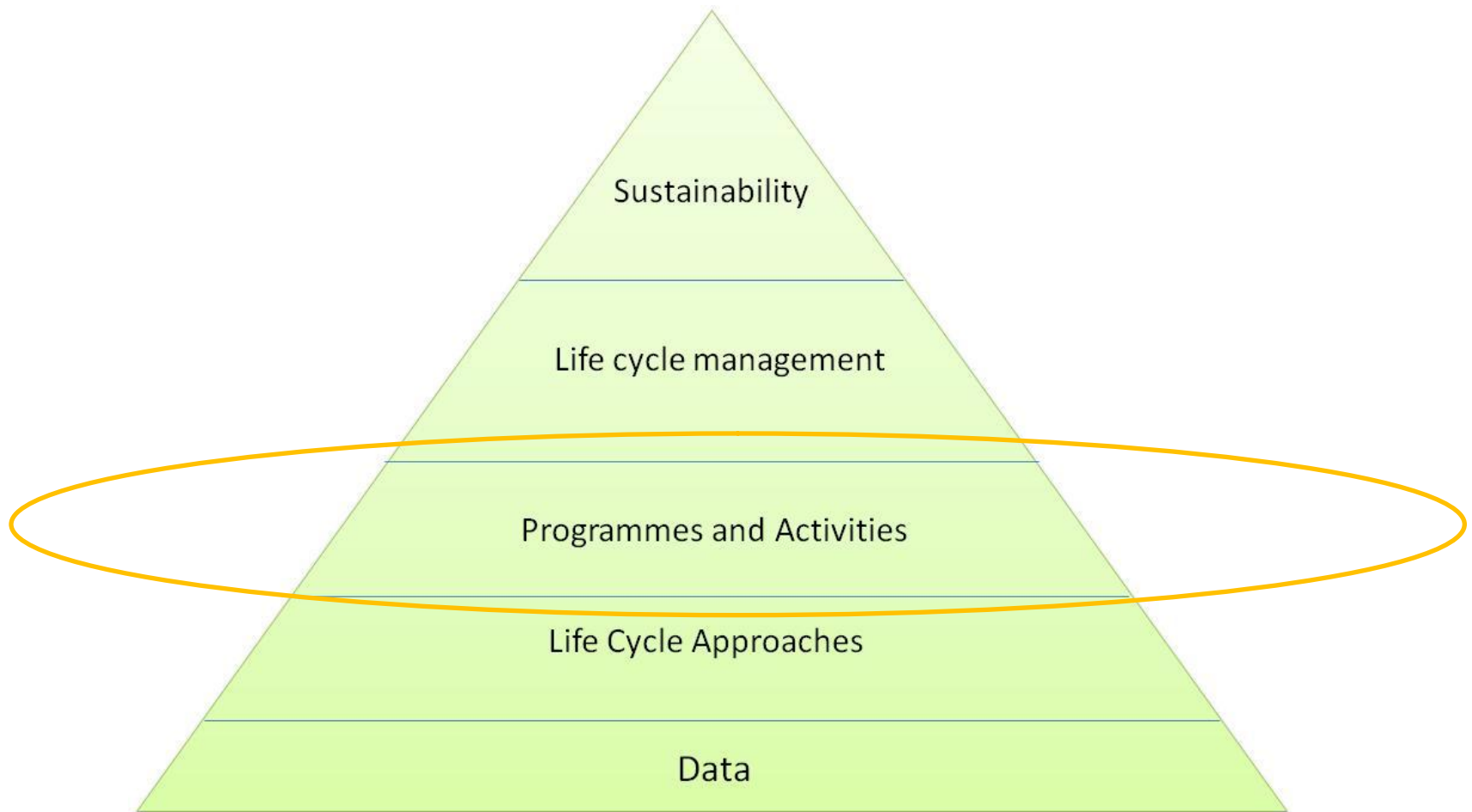


# 14025 Objectives

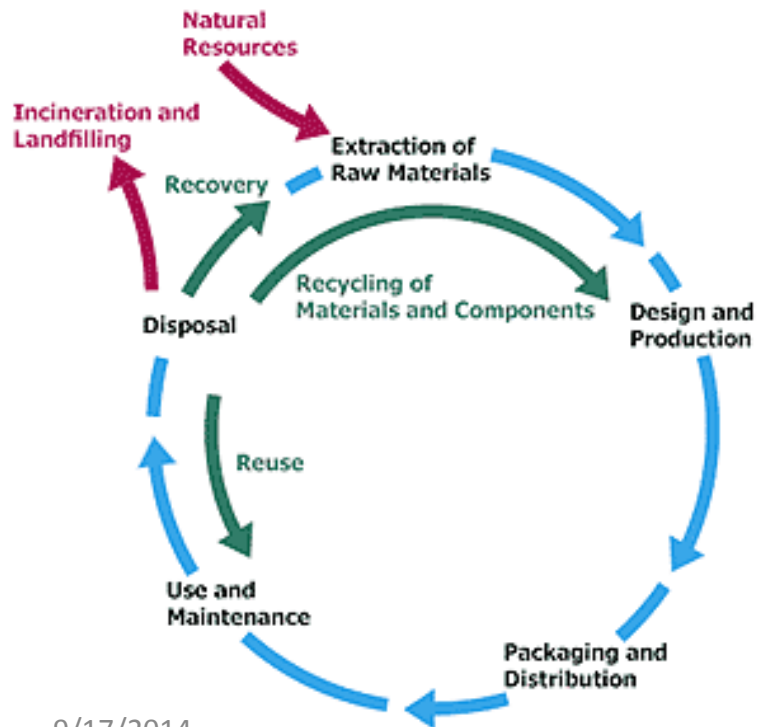
- Provide LCA-based info on environmental aspects of products
- Assist purchaser and users make informed comparisons
- Encourage improved environmental performance
- Provide information for assessing the environmental impact of products over their life cycle



# UNEP/SETAC Sustainability Framework



# Programs and Activities



PCRs  
(Product Category  
Rules)

EPD  
(Environmental Product  
Declaration)



# LCA studies → PCRs and EPDs

ex. EPD  
Program  
Operators



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## Environmental Product Declarations Program

- [About the Program](#)
- [Why ASTM International](#)
- [Product Category Rule](#)
- [EPD Development Process](#)
- [News](#)
- [Frequently Asked Questions](#)
- [Contact Us](#)

### About the Program

With the proliferation of green measurement systems and labels, there is a growing need to understand the true impact of a product on the environment. Environmental product declarations (EPDs) provide quantifiable environmental data to compare products that fulfill the same function. In order to create comparable EPDs, they must follow the same rules and guidelines called product category rules (PCRs).

PCRs, similar to standards, are best developed in a collaborative manner and ASTM is uniquely positioned to provide the venue for developing industry PCRs.

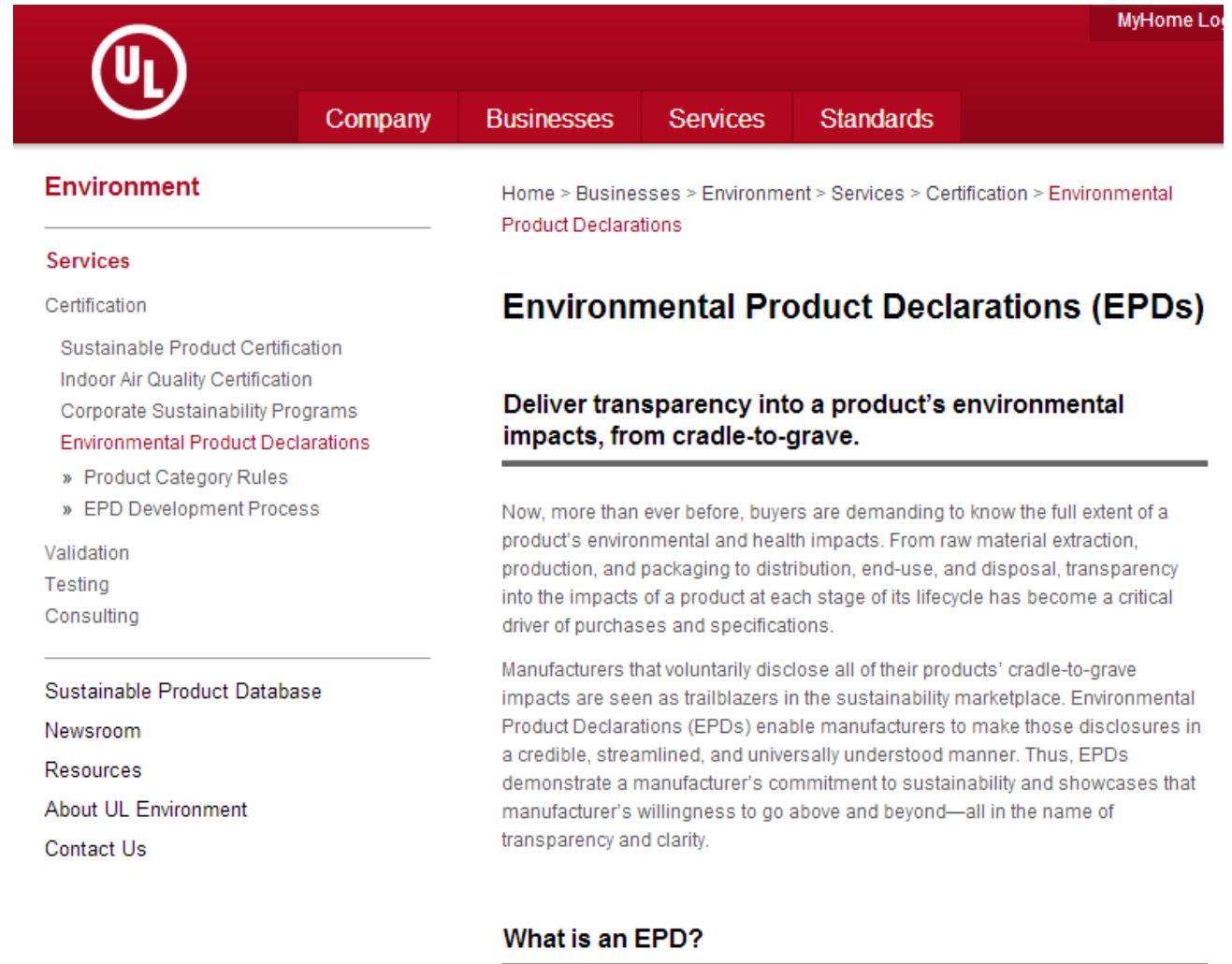
As a Program Operator, ASTM International has developed its program in conformance with ISO 14025 - Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures.

### Why ASTM International



# LCA studies → PCRs and EPDs

## ex. EPD Program Operators



The screenshot shows the UL website's navigation and content for Environmental Product Declarations (EPDs). The top navigation bar includes the UL logo, a "MyHome Lo" link, and tabs for "Company", "Businesses", "Services", and "Standards". The "Environment" section is highlighted in the left sidebar, with sub-links for "Services", "Certification", "Sustainable Product Certification", "Indoor Air Quality Certification", "Corporate Sustainability Programs", "Environmental Product Declarations" (selected), "Product Category Rules", and "EPD Development Process". The main content area displays the breadcrumb "Home > Businesses > Environment > Services > Certification > Environmental Product Declarations" and the title "Environmental Product Declarations (EPDs)". Below this is a sub-header "Deliver transparency into a product's environmental impacts, from cradle-to-grave." followed by a paragraph explaining the importance of transparency in environmental impacts. A second paragraph discusses how manufacturers can use EPDs to demonstrate their commitment to sustainability. The section concludes with the heading "What is an EPD?"

**Environment**

**Services**

Certification

- Sustainable Product Certification
- Indoor Air Quality Certification
- Corporate Sustainability Programs
- Environmental Product Declarations**
  - » Product Category Rules
  - » EPD Development Process

Validation

Testing

Consulting

Sustainable Product Database

Newsroom

Resources

About UL Environment

Contact Us

Home > Businesses > Environment > Services > Certification > **Environmental Product Declarations**

## Environmental Product Declarations (EPDs)

### Deliver transparency into a product's environmental impacts, from cradle-to-grave.

Now, more than ever before, buyers are demanding to know the full extent of a product's environmental and health impacts. From raw material extraction, production, and packaging to distribution, end-use, and disposal, transparency into the impacts of a product at each stage of its lifecycle has become a critical driver of purchases and specifications.

Manufacturers that voluntarily disclose all of their products' cradle-to-grave impacts are seen as trailblazers in the sustainability marketplace. Environmental Product Declarations (EPDs) enable manufacturers to make those disclosures in a credible, streamlined, and universally understood manner. Thus, EPDs demonstrate a manufacturer's commitment to sustainability and showcases that manufacturer's willingness to go above and beyond—all in the name of transparency and clarity.

### What is an EPD?

# LCA studies → PCRs and EPDs



ex. EPD  
Program  
Operators

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Responsible Forestry +

Climate +

Sustainable Seafood +

**Environmental Claims**

BIFMA level®

FloorScore®

Green Squared®

Indoor Air Quality

Green Product Certification

**Environmental Product Declaration**

Environmental Claims Validation


Environmentally Preferable Product

Life Cycle Assessment (LCA)

Safeway Bright Green

Home Depot Eco Options

Sustainability Services +



### Environmental Product Declaration

#### Full Transparency of Life Cycle Impacts

The Environmental Product Declaration (EPD) is an internationally recognized summary report used to transparently communicate the environmental performance of your products and services based on life cycle assessment (LCA). EPDs distill complicated information to empower your customers, architects and designers, procurement agents and consumers to make informed decisions.

SCS Global Services is a leading LCA practitioner and third-party certifier of environmental claims. We developed the world's first EPDs, and understand the importance of getting the science right while remaining cost-effective. Choose from existing Product Category Rules (PCRs) or take advantage of the most advanced LCA science to obtain

# LCA studies → PCRs and EPDs

ex. EPD  
Program  
Operators



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Public

[Home](#) > [Standards](#) > [Environment & Carbon Management](#) > [Environmental Product Labeling & Declaration](#)

## Environmental Product Labeling & Declaration

[Overview](#)

### Environmental Product Labeling & Declaration

Most organizations have developed an understanding of the importance of reducing their environmental impact. Carbon management programs are becoming commonplace, and progressive organizations are pursuing net carbon neutrality in their day-to-day operations.

But what about the environmental impact of the products they sell? In order to make more informed buying decisions, customers are driving organizations to become more transparent as to the environmental legacy their product offerings leave throughout their lifecycle.

One method that is gaining acceptance in North America and around the world is the use of "Environmental Product Declarations" (or EPDs). A key component of a fully-transparent EPD is the creation of an appropriate set of "Product Category Rules" (or PCRs).

As a recognized leader in global environmental standards development, with a proven reputation in product certification and testing services, CSA Group brings considerable credibility to its newly-announced role as a Program Operator for the development of PCRs. Harnessing our renowned consensus-based standards development process, CSA Group can bring disparate industry groups together for the purpose of creating a common set of procedures for evaluating the environmental impact of products. The end goal of the PCR development process is a set of criteria, endorsed by stakeholders, that enables fair comparisons of the environmental impact of similar products, helping facilitate informed product decisions.



# Overview of EPD Process



# Overview of EPD Process

- Product Category (PC)
  - Group of products that can fulfill equivalent functions
  - Ex. refrigerators, potato chips, insulation materials.
- Product Category Rule (PCR)
  - Set rules and format for publication of Environmental Product Declarations (EPDs) in a given product category.
  - Developed, independently verified and then published by a program operator.
- EPDs
  - declaration of quantified environmental performance information based on an LCA that is compliant with ISO 14040/44.
- Type III
  - Independently verified



# Overview of EPD Process

- Type III Environmental Declaration Programmes
  - Administered by a programme operator, who is responsible for its administration using established procedures (referred to as general programme instructions) for transparently carrying out;
    - PCR reviews, including how they were created
    - LCA reviews, including all information that declarations are based
    - Independent verification of Type III environmental declarations

Table A.1 — Type III environmental declaration programme development and operation scheme


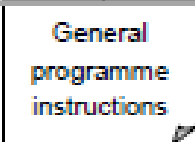
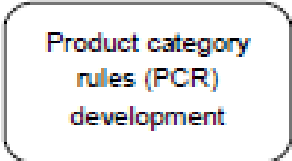
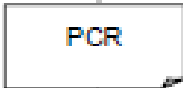
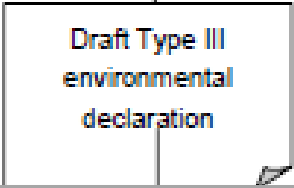
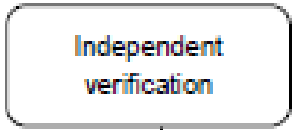
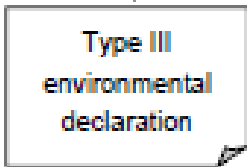
	Body			Flow (steps and results)	Activities/procedure		Subclause
	Organizations	Programme operator	Others		Main	Sub	
1		Programme operator [e.g. company(ies), industry sector, trade association or independent body]			Programme establishment		6.1
2		Programme operator	Interested parties		Development of the programme (including open consultation) <i>Not necessary if programme already exists</i>		6.2, 6.3, 6.4, 6.5, 8.3
3	Organizations	Programme operator	Interested parties		Development of the PCR document (including open consultation) <i>Not necessary if PCR already exist</i>		6.5, 6.7, 8.3
	Organizations	Programme operator	Interested parties			Definition of product category	6.6
	Organizations		Interested parties			Collection or creation of product category LCA-based information	6.7.1, 6.7.2, 6.8
4	Organizations	Programme operator	Interested parties			Development of the PCR document	6.7.1, 6.7.2
			PCR review panel: independent competent panel members			PCR review	8.1.2

Table A.1 (continued)

	Body			Flow (steps and results)	Activities/procedure		Subclause
	Organizations	Programme operator	Others		Main	Sub	
5	Organizations			 <pre> graph TD     A[Draft Type III environmental declaration]   </pre>	Drafting of declaration		7.1, 7.2.1, 7.2.2, 7.2.3
			Independent verifier		Independent verification		8.1.1, 8.2, 8.3
			Independent verifier			Verification of LCA data	8.1.3, 8.3
6			Independent verifier	 <pre> graph TD     A[Independent verification]   </pre>		Independent verification of the declaration	8.1.4, 8.3
			Third party			Third party verification <i>Not mandatory, except for B to C (see Clause 9)</i>	8.1.1, 9.4
7	Organizations	Programme operator		 <pre> graph TD     A[Type III environmental declaration]   </pre>	Recording and publication of the declaration		6.3
	Organizations		Addressed audience		Communication and use of the declaration		Communication is not covered by the scope of this International Standard.
	Organizations	Programme operator	Independent verifier		Updating of the declaration		7.3



## 1. Programme development

### 6.3 Responsibilities of the programme operator

The programme operator shall be responsible for the administration of a Type III environmental declaration programme.

This administration includes, but is not limited to, the following tasks:

- a) preparing, maintaining and communicating general programme instructions;
- b) publishing the names of the organizations actually involved as interested parties in the programme development (not individual names);

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- c) ensuring that the Type III environmental declaration requirements are followed (see Clause 7);
- d) establishing a procedure to safeguard the consistency of data within a programme;
- e) maintaining publicly available lists and records of PCR documents and Type III environmental declarations within the programme;
- f) publishing PCR documents and Type III environmental declarations within the programme;
- g) monitoring changes in procedures and documents of related Type III environmental declaration programmes and revising procedures and documents when necessary;
- h) ensuring the selection of competent independent verifiers and PCR review panel members (see 8.2.3);
- i) establishing a transparent procedure for the PCR review (see 8.1.2), including the scope of the review, details of the review and how the PCR review panel is constituted;
- j) establishing procedures to avoid misuse of references to this International Standard, the Type III environmental declaration programme, its Type III environmental declarations and, where relevant, its logo.

## 1. Programme development

## 2. General programme instructions

### 6.4 General programme instructions

The programme operator shall prepare general programme instructions describing the operation of the programme including, but not limited to, the following information:

- a) scope of programme;
- b) objectives of the programme;
- c) identification of programme operator;
- d) intended audience of the programme, which may be business-to-business (B-to-B) or business-to-consumer (B-to-C), or both;
- e) involvement of interested parties;
- f) procedure for definition of product categories;
- g) procedure for the management of the data and documentation used; such procedures may be based on ISO 14001:2004, 4.4.5, or ISO 14044:2006, Clause 5;
- h) data confidentiality management;
- i) procedure for development and maintenance of PCR, including
  - content of PCR,
  - rules for period of validity, which must include consideration of changes in relevant information affecting the PCR, and
  - selection procedure for predetermined parameters;
- j) procedure for independent verification, including
  - competence of verifiers, and
  - competence of PCR review panel;

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- k) funding sources and other resources provided for programme development and operation;
- l) periodic review of the programme instructions;
- m) fees, if relevant.

The general programme instructions shall be available to any person on request.

- 1. Programme development
- 2. General programme instructions
- 3. PCR development
- 4. PCR

- a) product category definition and description (e.g. function, technical performance and use);
- b) goal and scope definition for the LCA of the product, according to the ISO 14040 series, including
  - functional unit,
  - system boundary,
  - description of data,
  - criteria for the inclusion of inputs and outputs,
  - data quality requirements including coverage, precision, completeness, representativeness, consistency, reproducibility, sources and uncertainty, and
  - units;
- c) inventory analysis, including
  - data collection,
  - calculation procedures, and
  - allocation of material and energy flows and releases;

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- d) impact category selection and calculation rules, if applied;
- e) predetermined parameters for reporting of LCA data (inventory data categories and impact category indicators) (see Note below);
- f) requirements for provision of additional environmental information, including any methodological requirements (e.g. specifications for hazard and risk assessment); see 7.2.3 for information;
- g) materials and substances to be declared (e.g. information about product content, including specification of materials and substances that can adversely affect human health and/or the environment, in all stages of the life cycle);
- h) instructions for producing the data required to develop the declaration (LCA, LCI, information modules and additional environmental information);
- i) instructions on the content and format of the Type III environmental declaration (see 7.2);
- j) information on which stages are not considered, if the declaration is not based on an LCA covering all life cycle stages;
- k) period of validity.

# EPD Programme development and operation.

## 1. Programme development

ISO/FDIS 14025:2006(E)

## 2. General programme instructions

### 8.1.4 Independent verification of the Type III environmental declaration

The independent verification procedure shall as a minimum be appropriate to determine whether the Type III environmental declaration is in conformance with

- ISO 14020 and the relevant requirements of this International Standard,
- general programme instructions (see 6.4), and
- current and relevant PCR.

## 3. PCR development

The verification procedure shall be transparent. The independent verifier shall generate a report documenting the verification process, while adhering to the obligations of 8.3 covering rules for data confidentiality. This report shall be available to any person upon request.

## 4. PCR

The verification procedure shall confirm whether the information given in the Type III environmental declaration accurately reflects the information in the documents on which the declaration is based. The verification procedure shall also confirm whether this information is valid and scientifically sound.

## 5. Draft Type III EPD

The PCR review and the independent verification of the Type III environmental declaration are two separate processes. The independent verification of the Type III environmental declaration may be carried out by the PCR review panel, or may be carried out by an independent verifier who may or may not have been a member of the PCR review panel.

## 6. Independent Verification

## 7. Type III EPD



# Development of Standards and Markets for EPD use.

1

# Programs and Activities

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## Standards and Guidance Programs for Buildings.

- LEED v.4
- Green Globes
- IgCC
- CalGreen



## Guidance

- ISO 21931-1
- EN 15978
- Athena Guidelines

# Programs and Activities

---

## Organizational Activities for Buildings

- Natural Resources Canada
  - Federal Sustainable Development StrategyNRCan strategy includes assessment of embodied carbon
- Olympic Games
  - Impact StudiesEn 27: Life-cycle Inventory of Olympic and Paralympic Venues
- University of British Columbia
  - inclusion of LCA in request for information from architects and consulting teams



<http://www.coldstreamconsulting.com/life-cycle-analysis>